

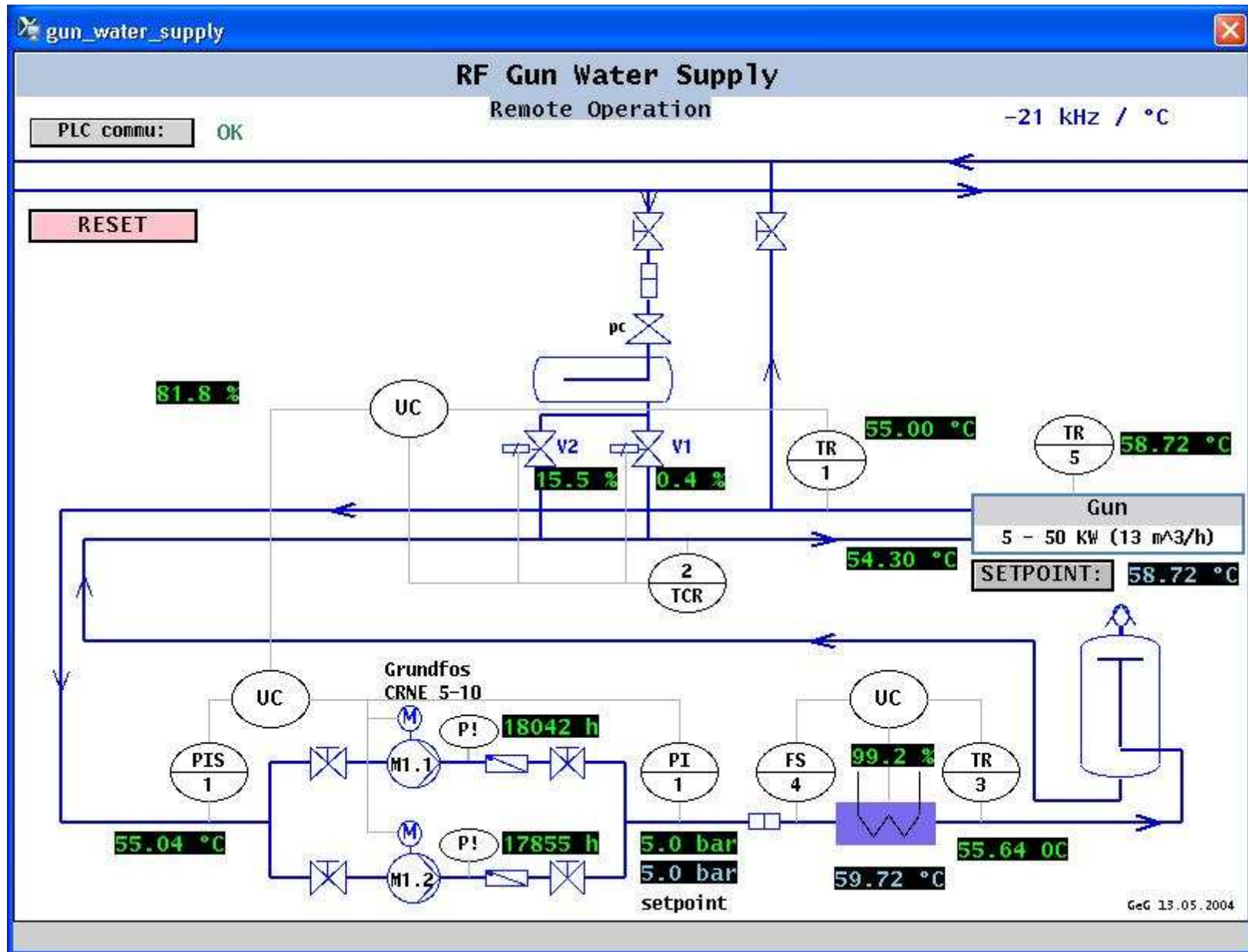
Automation of the Gun

M.Grecki, MSK Group

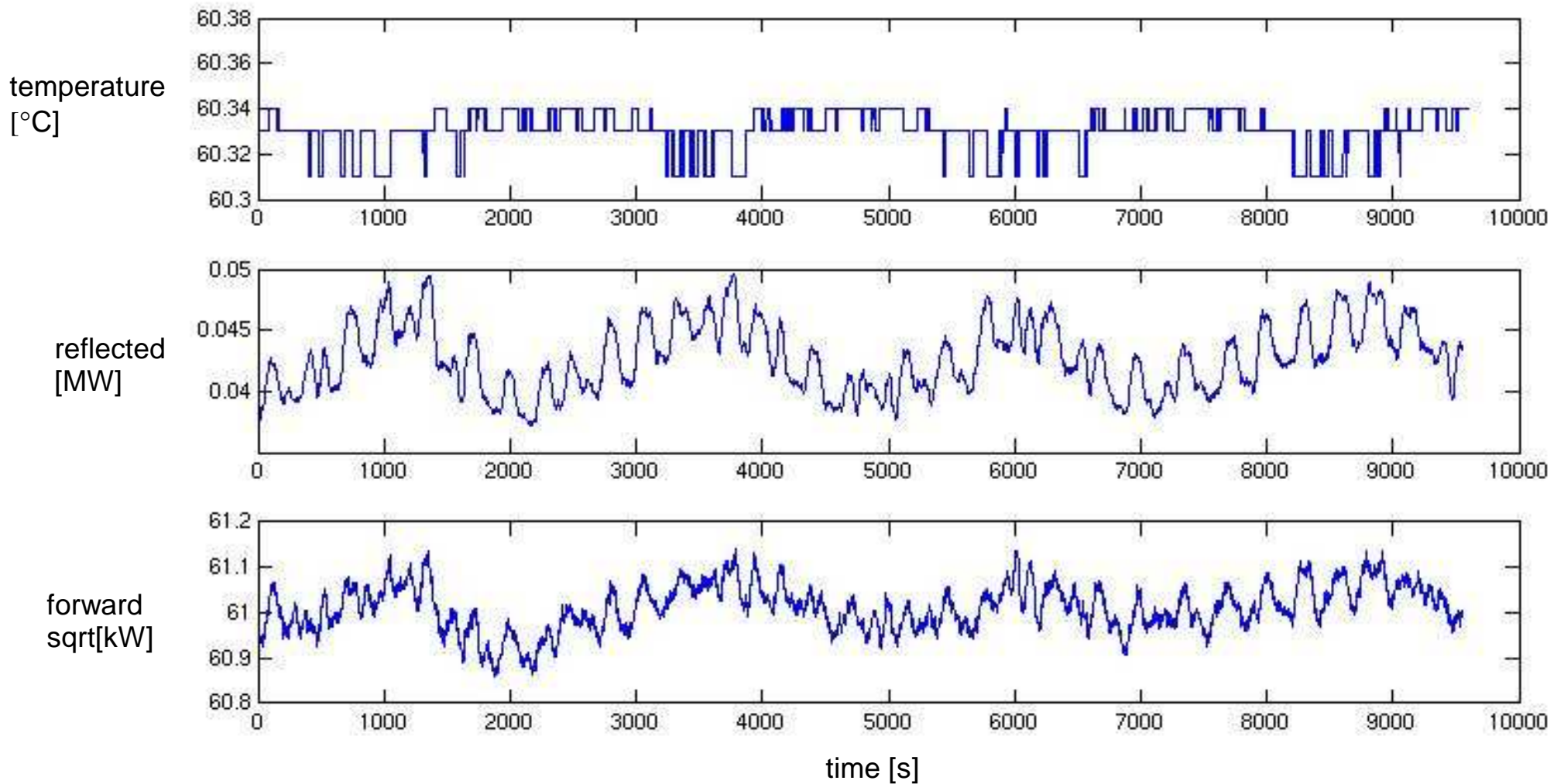
GUN at FLASH

- normal conducting cavity
- power dissipation 5-50kW
- -21kHz / °C
- operating temperature ~59°C
- Iris temperature stabilized by water cooling
 - works perfectly in steady-state conditions
 - long transients when RF power fluctuates

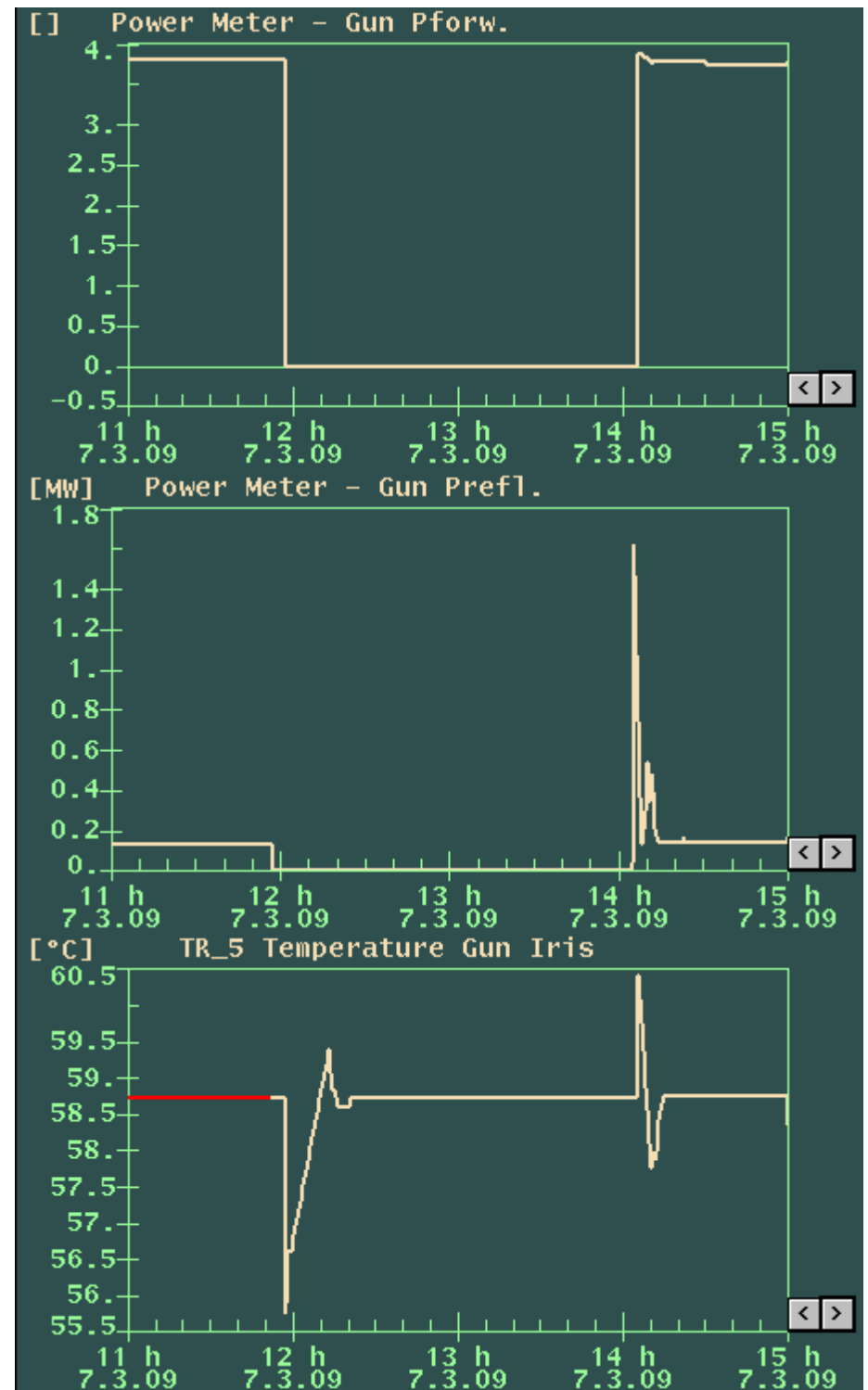
Gun temperature regulation



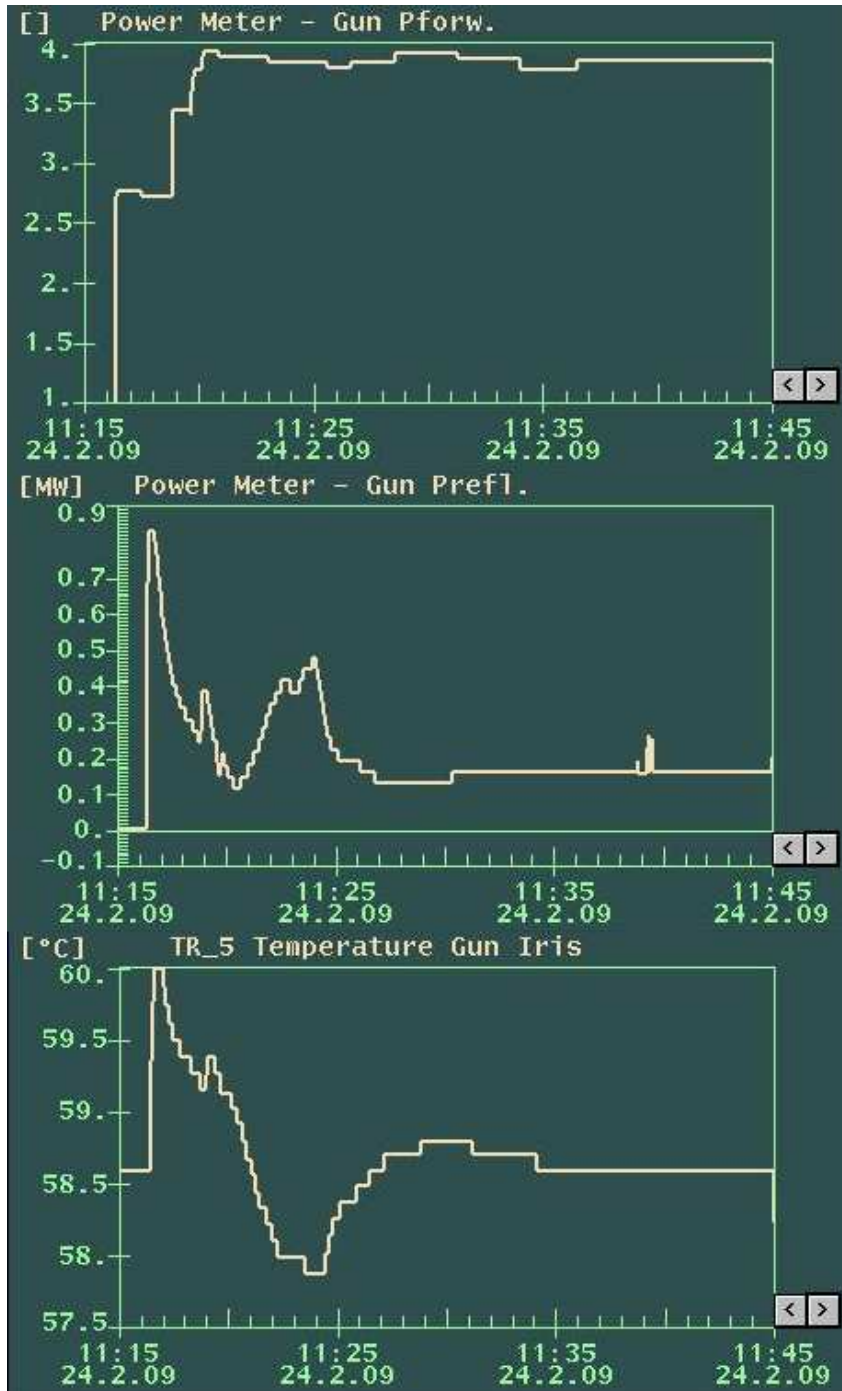
GUN temperature & klystron power (steady-state, FF+FB)



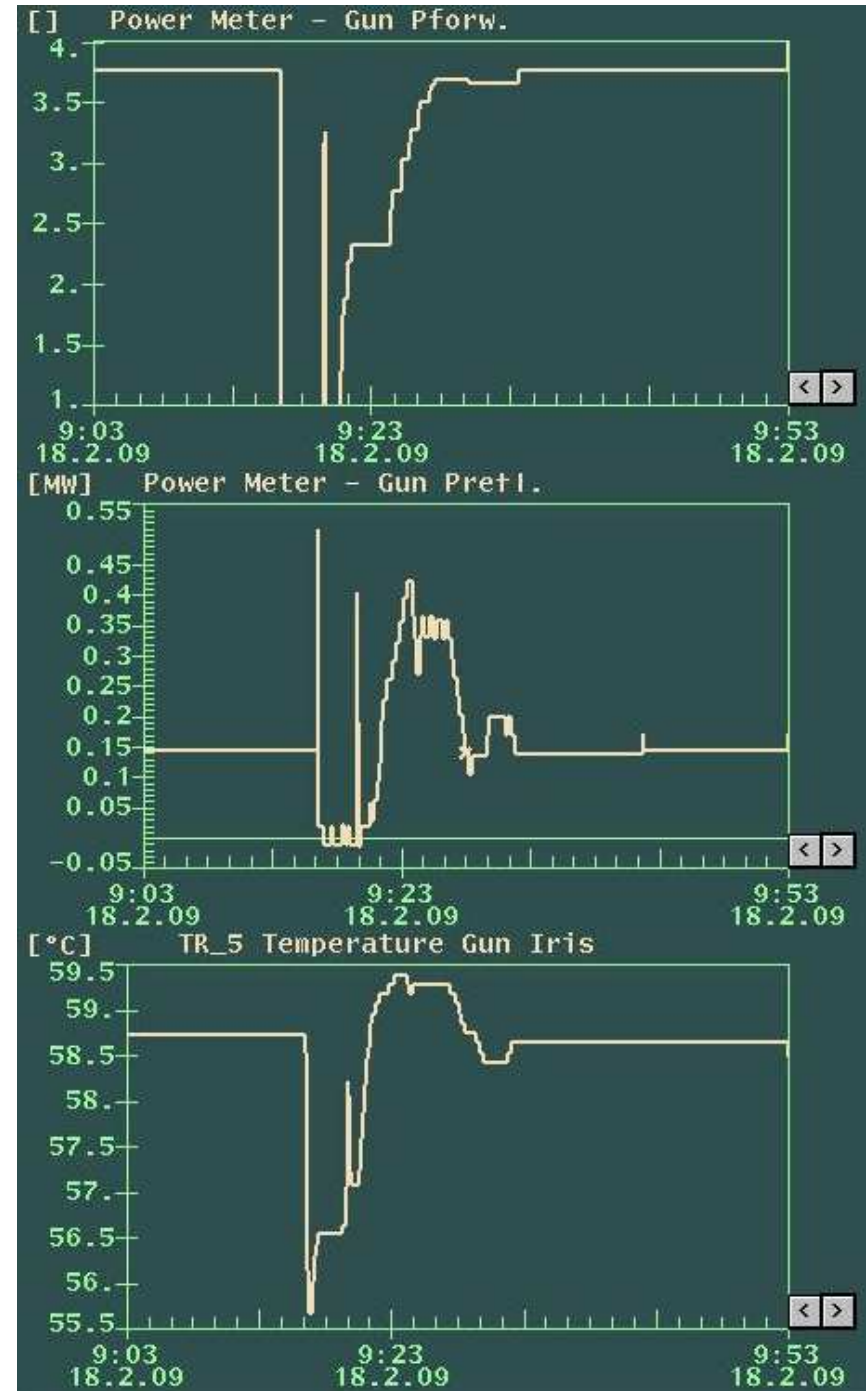
Gun control in transients



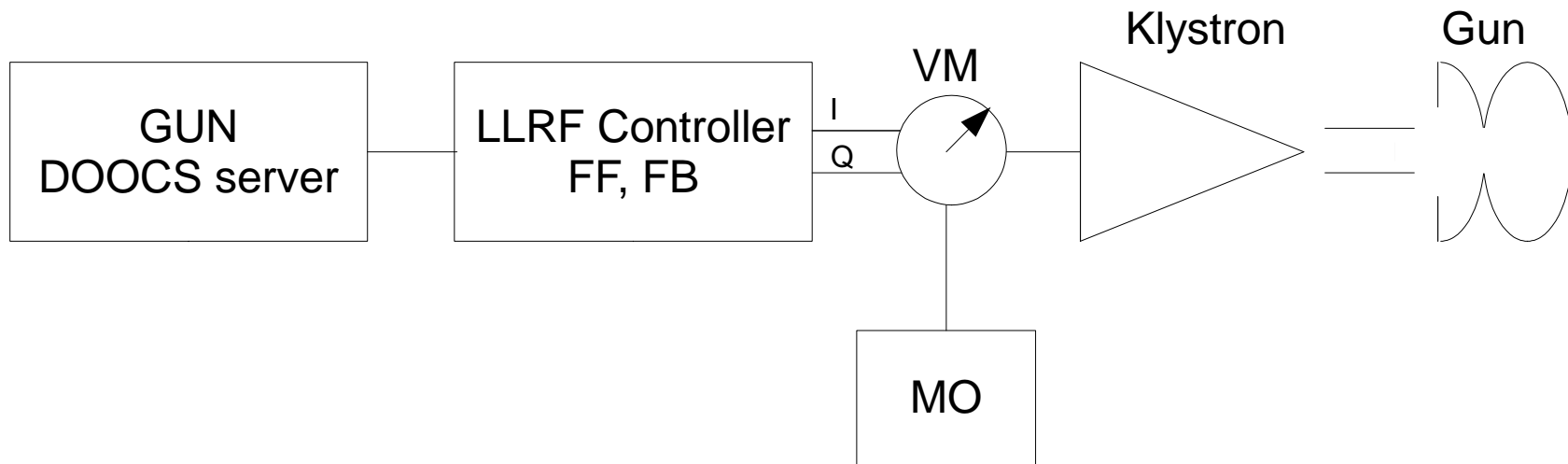
Turning-on



Turn-on after interlock

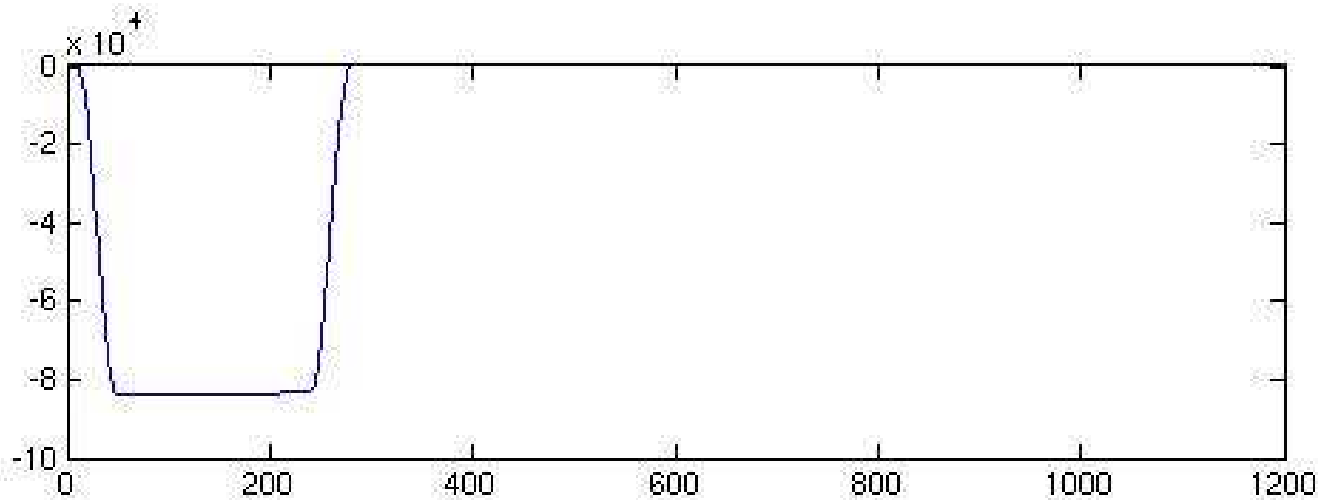
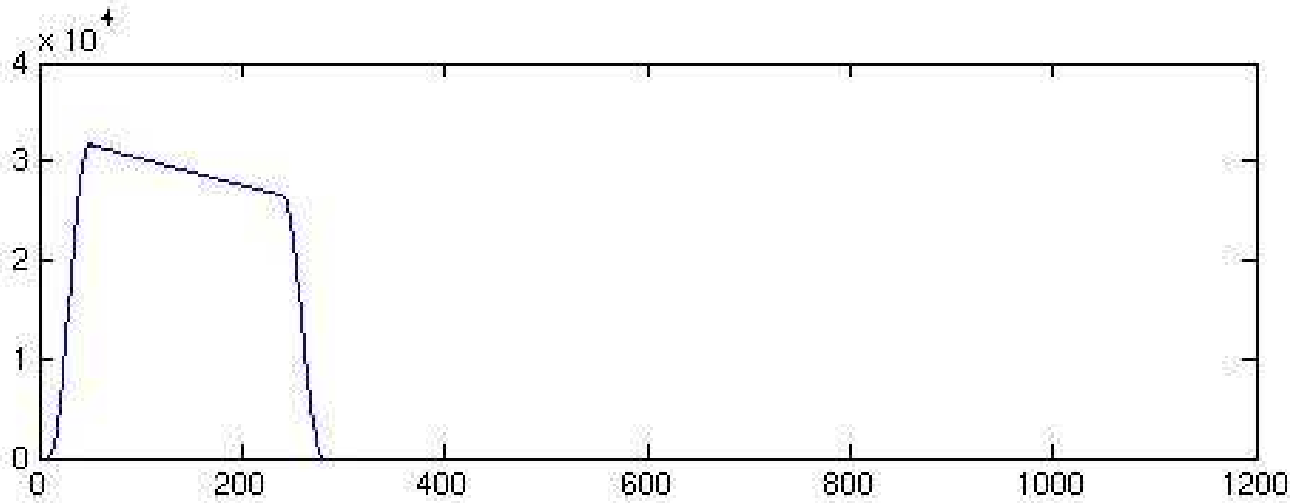


RF control for the Gun

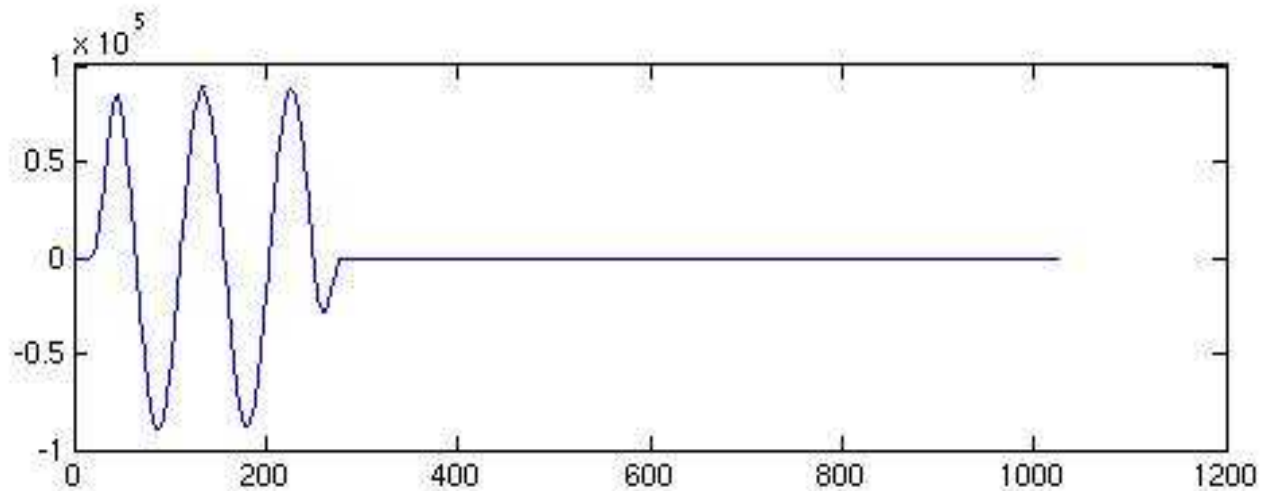
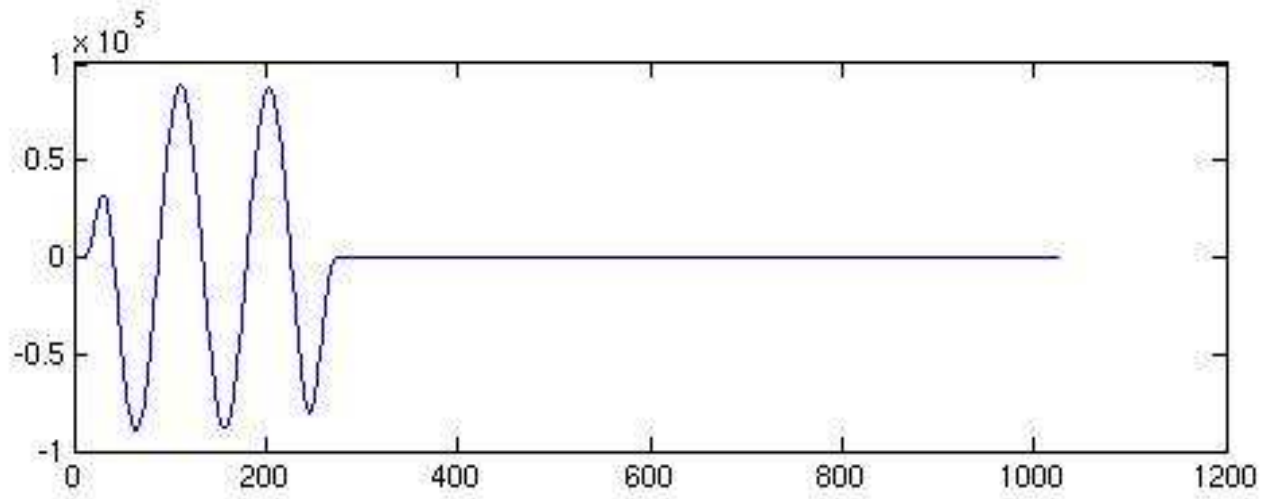


- FF tables are calculated by Gun DOOCS server according to requested operating conditions and uploaded to the controller (SimCon FPGA)
- for changing frequency of RF power one need to modulate FF tables

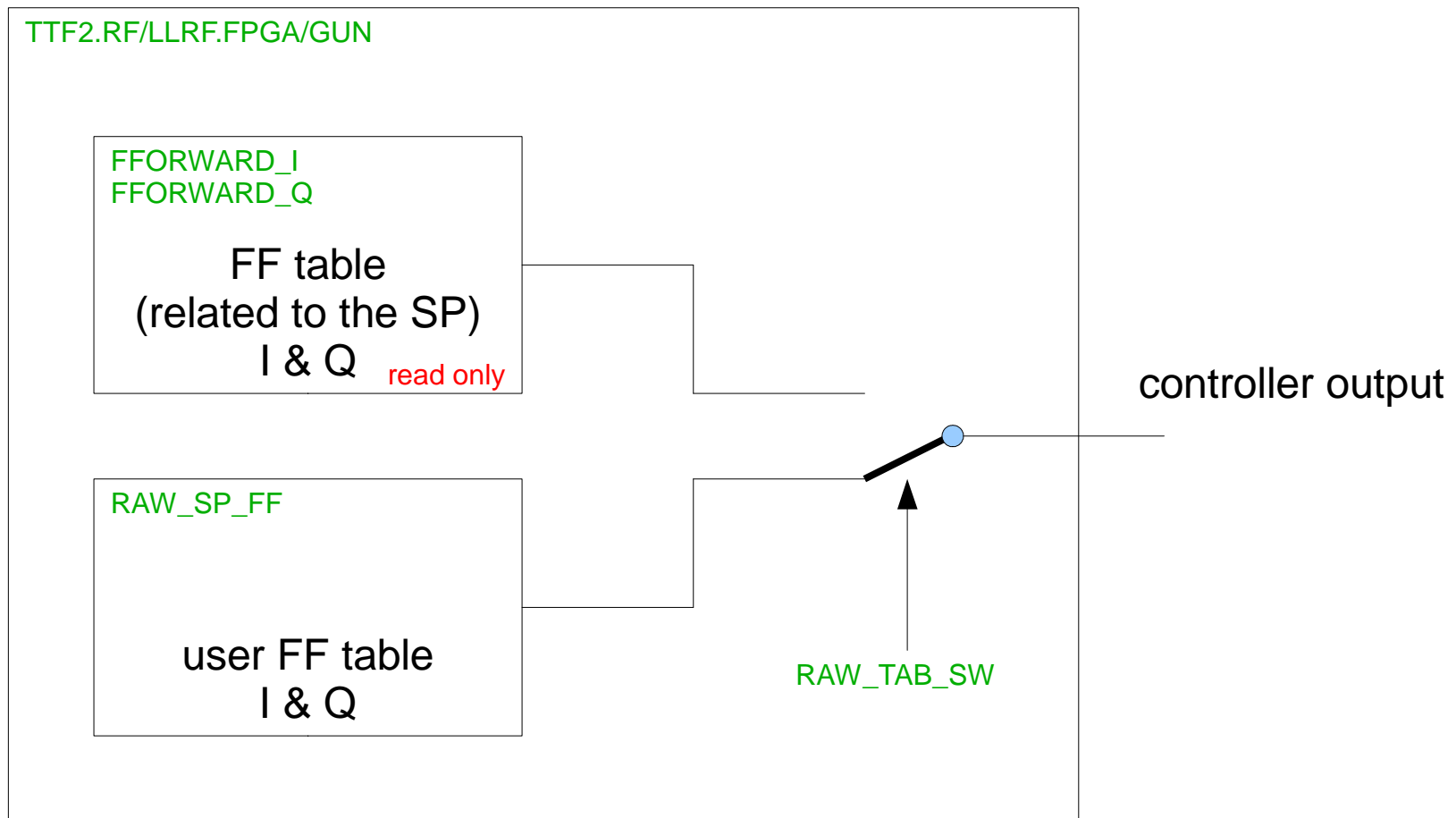
Calculated FF table for detuning 0Hz



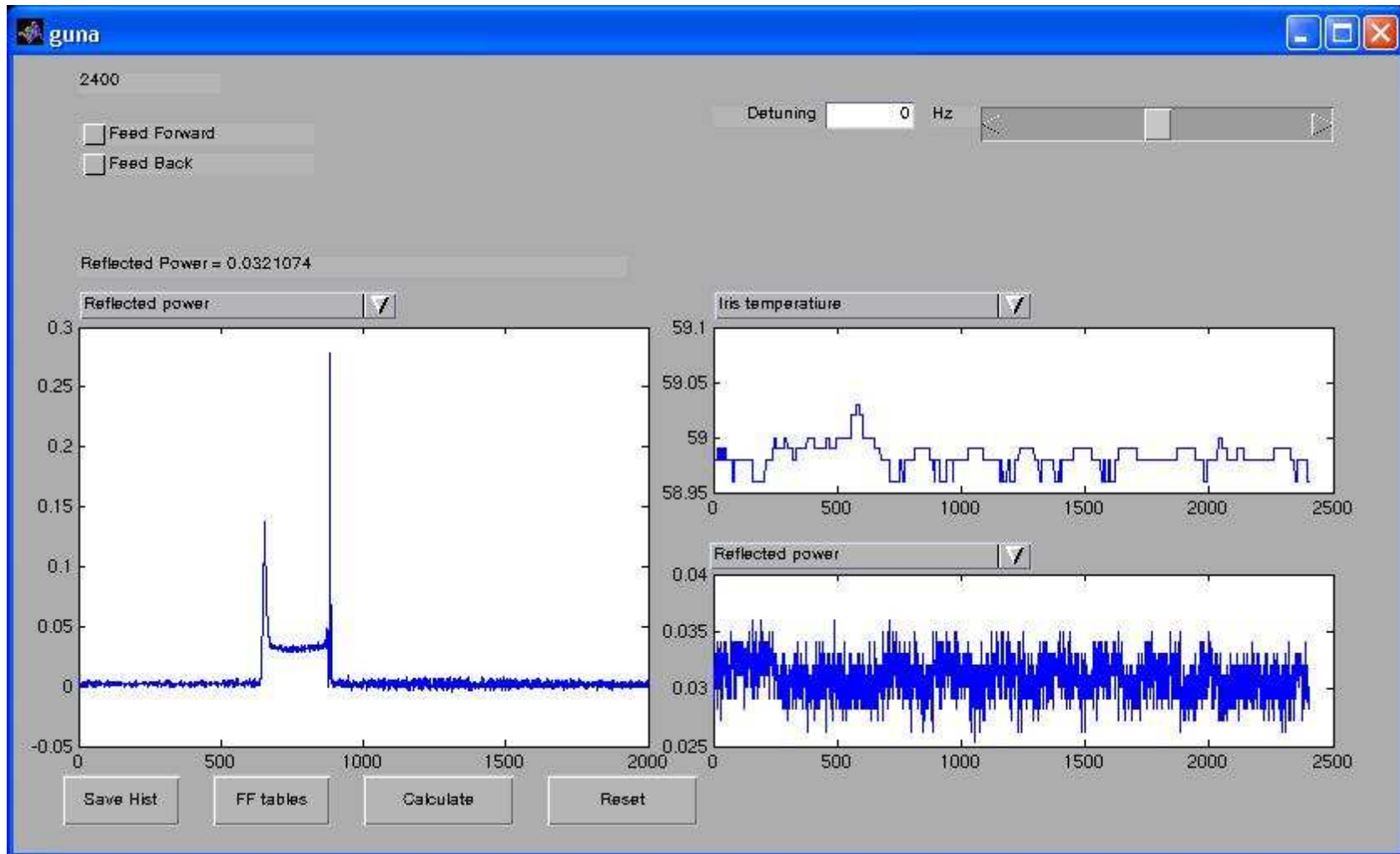
Calculated FF table for detunning 4kHz



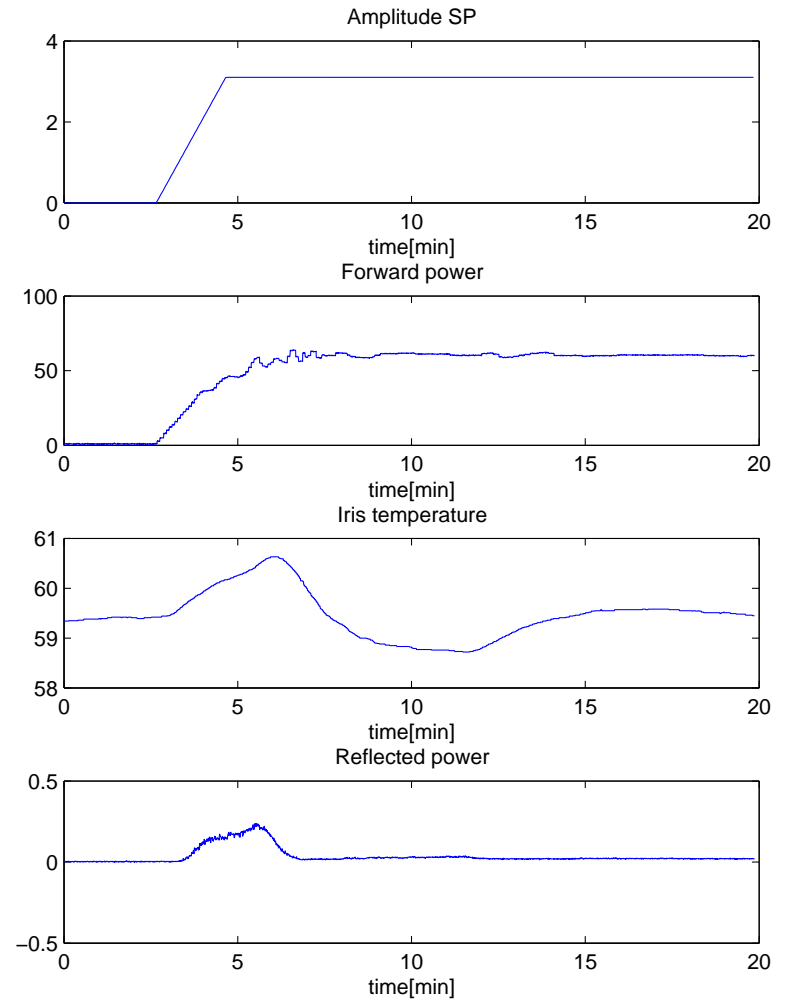
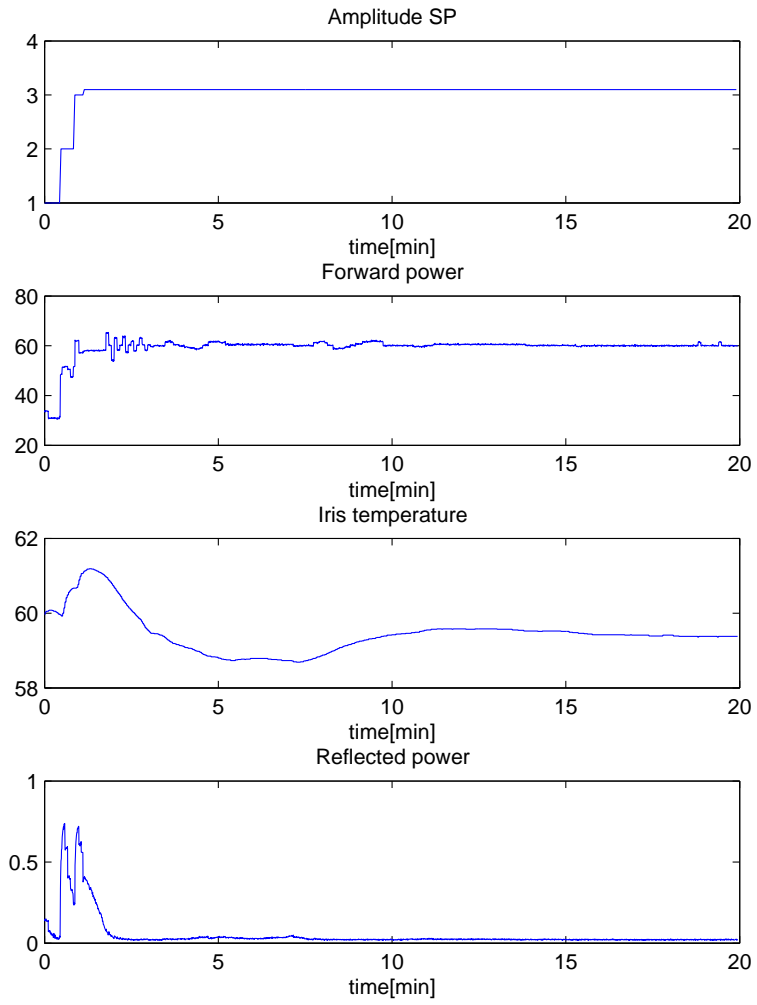
Gun DOOCS server (after modifications)



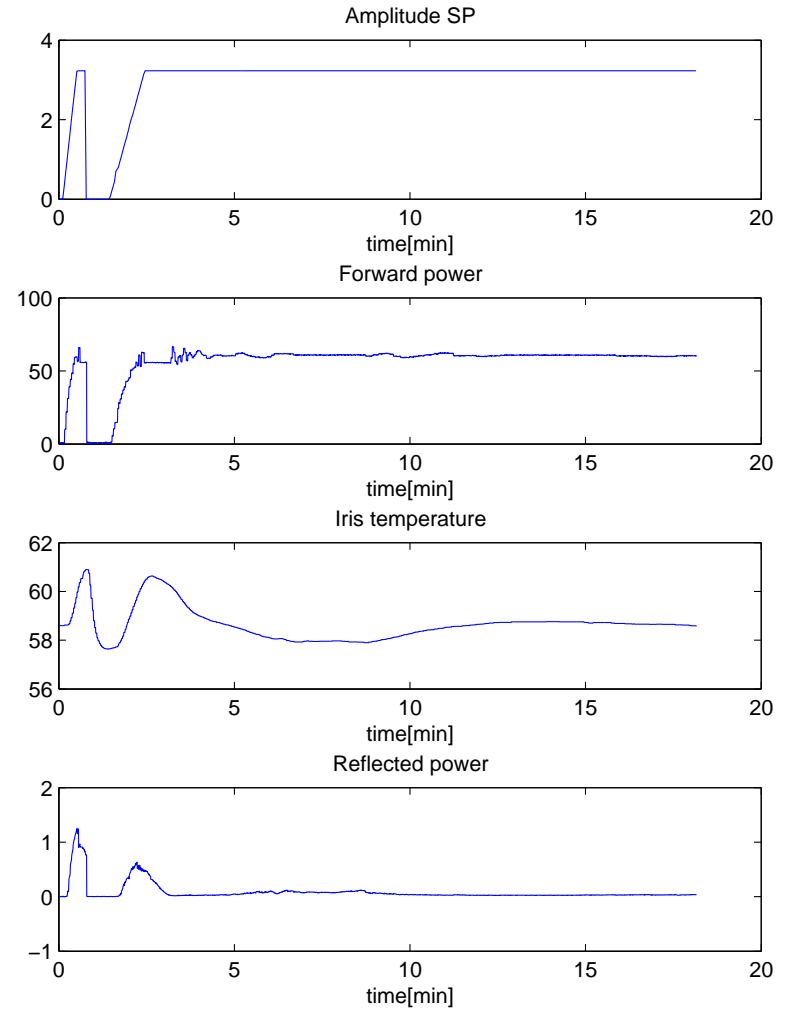
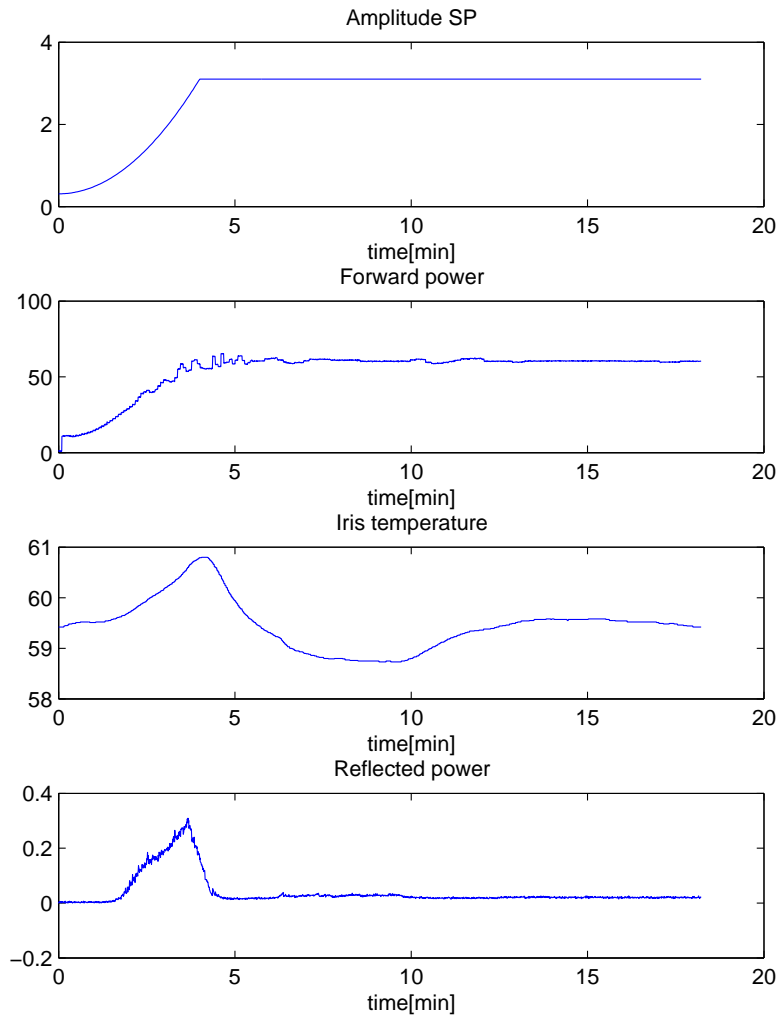
Matlab GUI for Gun control



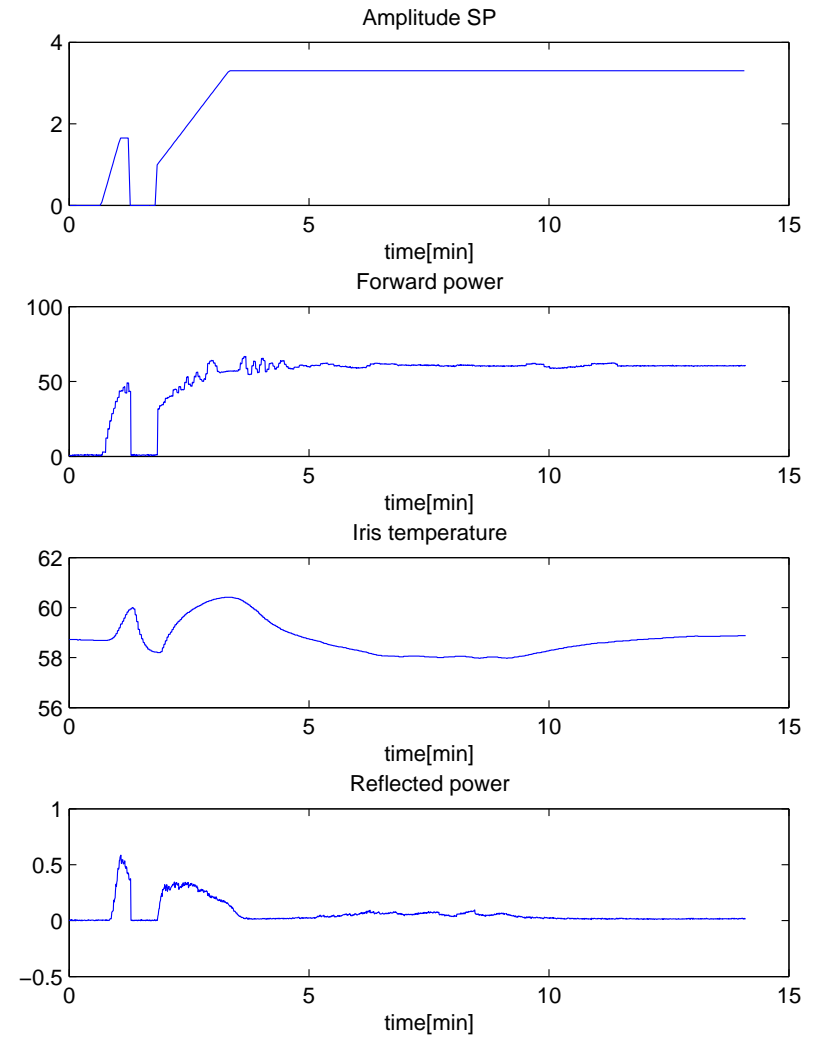
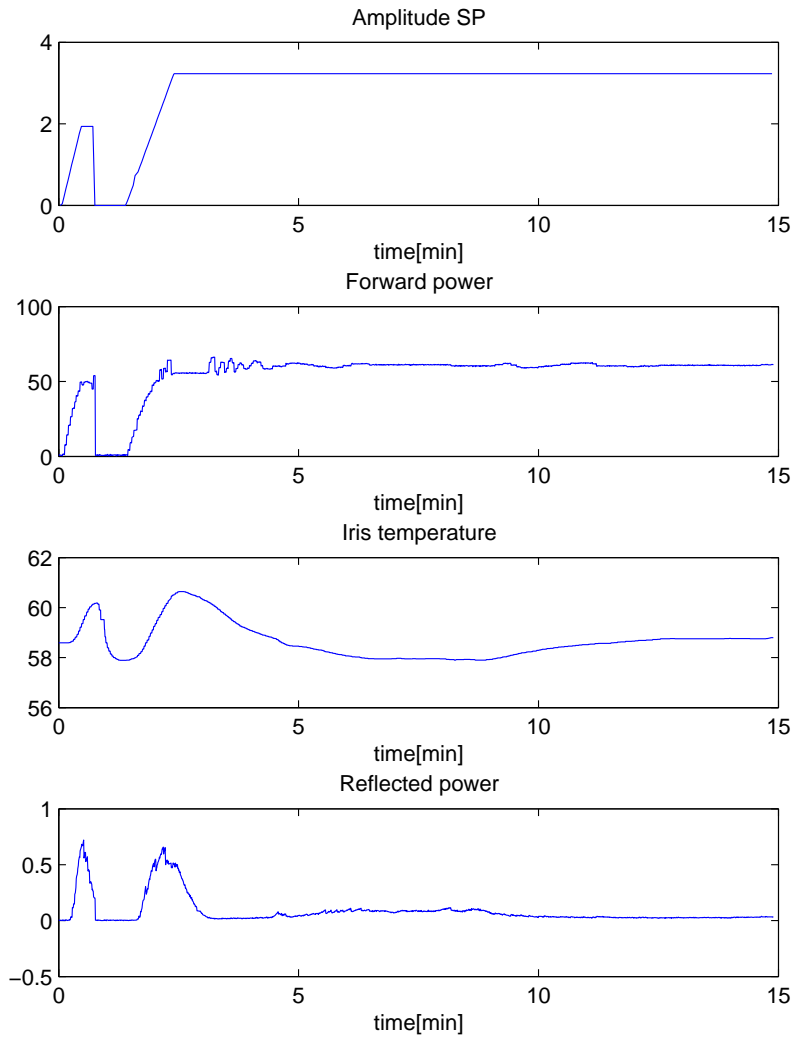
Gun startup (1)



Gun startup (2)



Gun startup (3)



Conclusion

- DOOCS server equipped with user FF tables functionality
- Matlab GUI for automatic and manual control of the Gun
- prepared Matlab script for Gun startup
- several startup-strategies tested, more will be tested